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Katsuhisa Sawazaki

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MCGINN & GIBB

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EXAMINER

BAUMEISTER, BRADLEY W

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory ActionApplication No.
09/522,832Applicant(s)
Sawazaki et al.Examiner
B. William BaumeisterArt Unit
2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED Oct 31, 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

Therefore, further action by the applicant is required to avoid the abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

THE PERIOD FOR REPLY [check only a) or b)]

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
- (b) ☐ they raise the issue of new matter (see NOTE below);
- (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____

3. ☐ Applicant's reply has overcome the following rejection(s): _____

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because:
see attachment

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, the ~~proposed amendment(s)~~ ^{request for reconsideration} a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____

Claim(s) objected to: _____

Claim(s) rejected: 1 and 4-17

Claim(s) withdrawn from consideration: _____

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

10. ☐ Other: _____

BRADLEY BAUMEISTER
PRIMARY EXAMINER

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/31/2003 have been fully considered but they are not persuasive. Applicant has made numerous arguments in the 18 page response.¹ These arguments can generally be subdivided into two categories: (1) whether Nakamura '307 anticipates the claims; and (2) whether the claims are alternatively obvious over Nakamura '307, either alone or in combination with Nakamura '350.

ANTICIPATION:

2. Applicant argues that Nakamura '307 does not disclose that the tunnel/clad 201 may be composed of the same material as that of the MQW barrier layer (e.g., claim 1), nor that the tunnel/clad and barrier layer may both be composed specifically of GaN (e.g., claim 7).

a. As was previously explained, Nakamura states that the tunnel/clads preferably have a band gap energy which is larger than that of the active layer by 0.01-4.05 eV (e.g., col. 4, lines 20-21); and that the tunnel/clad "201 is formed of a nitride semiconductor layer having a band gap energy larger than that of the active layer 16 (more strictly, its well layer)." The Examiner has

¹ The Examiner has addressed some of these arguments previously, either within the record or verbally during various personal interviews. While the following summary will attempt to address all of the arguments as completely as administratively possible, Applicant is invited to seek further clarification if any of the arguments have been inadvertently overlooked or if any responses are unclear.

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previously explained--on the record and further during various interviews--that one skilled in the art would understand these statements to be an alternative or synonymous way of stating that the tunnel/clad may be composed of any one of InGaN (wherein the tunnel/clad Ga content is insignificantly greater than that of the well layer), GaN, AlGaN and AlN, as desired. This is because the associated band gap is a function of the amount of In or Al that is alloyed with GaN. And further, because the barrier bandgap is necessarily significantly greater than 0.01 eV more than that of the well bandgap (otherwise the active region would be a bulk layer--not a MQW structure), this disclosure means that the tunnel/clad necessarily may have a bandgap that is either less than, equal to, or greater than the bandgap of the barrier. This, in turn, is another way of saying that the tunnel/clad layer composition may possess relative to the barrier, either (1) a different composition with more indium than does the barrier, (2) the same composition (either InGaN or GaN), or (3) a different composition with more aluminum than does the barrier (the barrier would still have no Al). Thus, contrary to Applicant's position, it is Nakamura '307--not the Examiner--that discloses that the tunnel/clad and the barrier may be formed of substantially the same materials. Therefore, the claims are anticipated.

i. Applicant continues to urge that this relationship--of the same composition--is not disclosed by Nakamura. However, Applicant has proffered no arguments as to why the Examiner's stated analysis is incorrect. As such, no factual bases exist to support Applicant's assertion that the anticipation-rejection is improper.

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ii. Applicant further argues that none of the drawings, nor any of the 15 examples set forth in Nakamura '307 expressly discloses that the tunnel/clad and barriers may be composed of the same composition. However, the fact that certain, isolated portions of a reference may not disclose a particular structural relationship, does not negate the fact the reference does disclose within another portion (e.g., col. 4, lines 20-) that this particular structural relationship may be satisfied.

b. Applicant makes further arguments that applicant's invention produces unexpected results in relation to color purity. The issue of color purity will be revisited below. However, with respect to the anticipation rejections, Applicant is reminded that "evidence of secondary considerations, such as unexpected results or commercial success, is irrelevant to 35 USC 102 rejections and thus cannot overcome a rejection so based." MPEP 2131.04, citing *In re Wiggins* [citation omitted]. MPEP 2131.05 further states that "[a]rguments that the alleged anticipatory prior art is 'nonanalogous art' or 'teaches away from the invention' or is not recognized as solving the problem solved by the claimed invention, [are] not 'germane' to a rejection under section 102." [internal cites omitted]

c. Dependent claim 7 further requires that this same material, of which the clad/tunnel and barrier layers are composed, is specifically GaN. The Examiner has previously pointed out that Nakamura '307 expressly teaches that the barrier may be composed of GaN as well as AlGaIn (e.g., col. 6, lines 25-30). Thus, Nakamura's teaching that these two layers may be composed of

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the same material combined with its further teaching that the barrier may be composed of GaN anticipates claim 7.

i. In response to this position, Applicant has argued that Nakamura goes on to state that AlGa_N is even a better material than GaN for the barrier composition. Therefore, Nakamura teaches away from GaN barriers. However, Applicant is reminded that MPEP 2131.05 further states that “a reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference ‘teaches away’ from the invention is inapplicable to an anticipation analysis.” [internal cites omitted]

ANTICIPATION/OBVIOUSNESS OF RANGES:

3. As was explained hereinabove, Nakamura 307's disclosure--that the tunnel/clad may have a bandgap energy that is anywhere from 0.01 to 4.05 eV above that of the active region's well layer--is synonymous with stating that the tunnel/clad and barrier may be composed of the same material, or alternatively, of different materials. However, this “0.01-4.05 eV” language might be deemed to be a recitation of a type of range that requires the further analysis as to whether a more narrowly claimed range (in this case the particular energy point corresponding to the same composition) that is located within the prior-art's disclosed range is set forth in the prior art with sufficient specificity so as to serve as the basis for anticipation, or even if not, whether selection of the particular point would have at least been obvious. As such, the claims are alternatively analyzed for anticipation/obviousness according to the “range doctrine.”

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a. Applicant has argued that the Examiner's reliance upon *Ex parte Lee* was misplaced because of purported differences in the underlying facts. To clarify the record, *Ex Parte Lee* was not relied upon for any comparisons between the respective, underlying facts. Rather, the case was merely cited for the propositions that (1) the range-doctrine is currently still evolving (2) that the Board members sometimes do not agree as to whether a given fact pattern should result in rejections that are characterized as 102-anticipation rejections, or alternatively, as 103-obviousness rejections; and (3) that the Board has expressly approved Examiners taking the approach of making alternative 102/103 rejections.

b. The Examiner has already set forth the rationale why the reference's broad range, "0.01-4.05 eV," discloses the narrow range, "substantially the same material," with sufficient specificity to constitute an anticipation rejection. Under this anticipation theory, Applicant's arguments relating to "unexpected results" and "teaching away" are irrelevant for the reasons set forth above in the anticipation section.

c. The Examiner has also already set forth reasons for why, if not anticipated, the narrow-range limitation of "substantially the same composition" is at least obvious in light of the prior-art's broad range of 0.01-4.05 eV. However, the Examiner is still of the opinion that Nakamura anticipates claim 1--as opposed to rendering it obvious. This is because claim 1 does not set forth any particular material of which the tunnel/clad and barrier are to be composed. For example, claim 1 is broad enough to read on a structure wherein the respective layers are both simultaneously composed of any one of InGaN, GaN or AlGaN. Because Nakamura implicitly

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discloses--through the "0.01-4.05 eV" language--that the relevant layers may have the same energy (and therefore the same composition), and because claim 1 does not require further considerations as whether this particular material is, in fact, any particular one of InGaN, GaN, or AlGaN, the claim is anticipated.

d. Claim 7 further specifically requires that the tunnel/clad and the barrier both be composed specifically of GaN. The Examiner has previously explained that Nakamura '307 discloses (1) that the materials may be of the same composition and (2) that the barriers may specifically be composed of GaN. These two portions of the disclosure, in combination, meet all of the limitations of claim 7, and the claim is therefore anticipated.

e. Without admitting that Nakamura '307 discloses that the materials may be the same, Applicant argues that even if this were so, Nakamura '307, read as a whole, does not teach with sufficient specificity so as to constitute an anticipatory 102-rejection, the simultaneous combination of the same-composition teaching and the GaN-barrier teaching so as to arrive at the structure of claim 7. Applicant then proceeds to argue why claim 7 is unobvious due to secondary consideration.

f. Having assumed *arguendo* that claim 7 is not anticipated for the above reasons, the Examiner has previously cited additional, secondary considerations for why it would have been obvious to have simultaneously combined these two portions of Nakamura '307 in a single device:

c. Alternatively, assuming *arguendo* that Nakamura must be interpreted so narrowly such that the disclosure of the range is not a disclosure (that the tunnel/clad 201 may also be composed of GaN) of sufficient particularity as to

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constitute a data point that would serve as the basis for a 102 anticipation rejection, the claim would nonetheless be obvious over Nakamura. This is because changing the bandgap(/composition) of the tunnel/clad does not produce any unexpected results. Rather, such changes produce well understood and expected results: as the bandgap increases (as more Al is added to GaN), the tunnel/clad becomes progressively more efficient in preventing carrier overflow, and the injection efficiency decreases somewhat relative to if no tunnel/clad was present (because the tunneling probability is necessarily less than 1 and increasing the tunnel/clad bandgap increases the proportion of carriers that are injected by tunneling). Conversely, as the bandgap decreases, (as the Al is decreased or as more In is added to GaN), the injection efficiency increases, but the tunnel/clad becomes progressively less efficient in preventing carrier overflow from the opposite side of the active region. Also, increasing the thickness of a tunnel/clad of any given bandgap decreases the tunneling probability.

d. Accordingly, since Nakamura teaches that active layer barrier may be GaN and the tunnel/clad may be made of any bandgap/composition within a range that includes GaN, it would have been obvious to one of ordinary skill in the art at the time of the invention to make both the active region's barriers and the tunnel/clad of GaN because this particular combination is within the range of possibilities disclosed by Nakamura, and one of ordinary skill would have been motivated to choose this particular combination depending only upon conventional and well understood considerations such as the desired light-emission wavelength of the MQB and the desired balance of the tradeoff between injection efficiency and carrier overflow of the particular application; or for various other reasons such as (1) because binary compounds (i.e., GaN) are more stable and easier to form than tertiary compounds (e.g., AlGa_xIn_{1-x}N); or (2) for considerations of better lattice-matching of the tunnel/clad to the adjacent MQB barrier since GaN has a lattice constant that is closer to the InGa_xN compositions than does any of the AlGa_xIn_{1-x}N compositions. (Office Action #28, dated 7/26/2003, paragraphs 5c-d.)

g. Applicant has argued that making the tunnel/clad composition the same as that of the MQW barrier would improve the color purity and that Nakamura '307 does not recognize this advantage. However, the fact that applicant may have recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for

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patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Nakamura '350

4. In Applicant's last amendment (paper #27, filed 5/14/2003), applicant added new combinations of limitations by means of claims 9 and 17 wherein the tunnel/clad and the barrier are composed of the same material (e.g., previous language of claim 1) and also wherein the tunnel/clad directly contacts a further cap layer (e.g., new language of claim 9). The claims were subsequently rejected as anticipated by a new reference, Nakamura '350.

5. Nakamura '350 was also cited for the purpose of providing further support of the examiner's previous position that the combination of other limitations (such as claim 7's requirement that the tunnel/clad and barrier be specifically composed of GaN) would also have been obvious over Nakamura '307. See e.g., Office Action #28, paragraph 6.a:

Moreover, the fact that it was envisioned by the inventors of Nakamura '307 that GaN, in particular, could be employed for both the barriers and the n-type clad (tunnel/clad) is evidenced by the fact that the inventors of Nakamura '307 actually did employ GaN for both of these layers in Nakamura '350.
(Typographical errors and grammar edited)

6. Applicant argues (page 15, Relative to claims 9 and 17) that "Nakamura '350 does not teach a configuration matching the description of claim 1 in which the barrier layers are stated to

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be GaN, and the n-clad layer is stated as also being GaN, and the thickness of the n-clad layer is greater than that of the barrier layers.”

a. First, the Examiner notes that claim 1 does not additionally require that the barrier be composed of GaN; claim 1 requires that the clad have a thickness within the range of 100A to 500A; the clad be thicker than the barrier, and that they both be composed of “substantially the same material.”

b. Second, please note Example 13 of Nakamura ‘350 (col. 39), which is a variation of Example 8 (col. 37). In example 13, the n-tunnel/clad 125 is composed of 500-Angstrom thick $\text{In}_{0.01}\text{Ga}_{0.99}\text{N}$ (from example 8), and the barrier of the MQW active region (Example 13) is composed of 20-Angstrom thick $\text{In}_{0.02}\text{Ga}_{0.98}\text{N}$. Restated, the tunnel/clad has a thickness that is within the 100-500A range and is thicker than the barrier; and there is a 1% change in In/Ga concentration. Because the respective bandgaps and lattice constants are: GaN ~ 3.39 eV, 3.186 Å; InN ~ 1.89 eV, 3.5446 Å; this 1% change in the Ga/In composition produces a bandgap change of about 0.00474% and a lattice constant change of about 0.001% (ignoring band-bowing parameters). Because these percentage changes are so minute so as to be statistically insignificant, the recited materials also read on the limitation, “substantially the same material.”

c. As such, applicant’s subsequent argument (page 16, line 1)--that Nakamura ‘350 does not anticipate claim 1, and the Examiner has an initial burden to provide a reasonable burden to modify it--appears to be incorrect.

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7. Applicant further argues that relative to claims 9 and 17, Nakamura [sic: '350] does teach against using GaN as the first p-clad layer 61. The Examiner would have the initial burden of overcoming this express preference in Nakamura.

a. As was explained previously, Nakamura '350 provides various embodiments wherein both the MQW barriers and the tunnel/clad are composed of GaN. (See e.g., the fifth through the seventh embodiments. The features of the active layer of the 7th embodiment may be the same as those explained in the 1st, 5th and 6th embodiments (col. 20, lines 38-39). The thicknesses of the well and barrier layers of the 5th and 6th embodiment may be the same as that explained with reference to the first embodiment (col. 16, lines 1-4). The first embodiment, in turn, states that the active layer may be composed of a SQW or a MQW structure (e.g., col. 6, lines 20-; col. 7, lines 33-). The wells and barriers may be composed of (In)GaN (e.g., col. 7, and col. 15, lines 25-30).

b. Again, MPEP 2131.05 states that "a reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference 'teaches away' from the invention is inapplicable to an anticipation analysis." [internal cites omitted]

c. As such, the question of whether these claims are anticipated does not rest on whether the reference teaches both may be composed of GaN. Rather the issue devolves to whether, in those portions that do teach composing both of GaN, the reference teaches that the clad should be thicker than the barrier. Nakamura '350 does not expressly recite that when GaN

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barriers and clads are employed, the clad thickness will necessarily be greater. Rather, the alternative case is theoretically possible because Nakamura '350 recites overlapping ranges: e.g., the tunnel/clad may range between 10 Å to 1.0 µm and more preferably from 30 Å to 0.1 µm (col. 7, lines 15-20) and the barriers of the MQWs should be 150 Å or less (col. 7, lines 65-67). However, every single example which employs a MQW active region provides barriers that are orders of magnitude thinner than the tunnel/clad. For example, Example 4: clad = 100 nm and barrier = 50 Å; Example 13: clad = 500 Å and barrier = 20 Å; Example 24: clad = 500 Å and B = 10 Å; Example 25: clad = 500 Å and barrier = 50 Å; and Example 26: clad = 500 Å and barrier = 50 Å. Thus, when all of the parts of Nakamura '350 are read as a whole, as urged by Applicant, one skilled in the art would understand--notwithstanding the theoretical potential for range overlap--that Nakamura teaches this thickness relationship with sufficient specificity to support an anticipation rejection of those claims that further set that the barrier is composed of GaN.

THE OBVIOUSNESS OF THE COLOR-IMPURITY CONSIDERATION

8. Applicant argues that issue of color-purity was not recognized by either Nakamura '307 nor Nakamura '350, and as such, the invention is not obvious over the references. More specifically, Applicant argues that neither Nakamura reference appreciated that color purity depends upon employing "substantially the same" material for both the clad and the MQW barrier.

a. Regarding those claims that are, in fact, anticipated, the issue of obviousness and secondary considerations is immaterial, as was previously explained.

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b. Regarding those claims that were rejected as obvious, the Examiner disagrees at least with the assertion that Nakamura '350 did not appreciate this factor.

i. Initially, the Examiner is under the impression that the following facts-- listed hereinafter to clarify the record--are undisputed as being well known by one of ordinary skill in the art. Applicant is invited to argue otherwise. (1) bandgap and lattice constant data for AlN, GaN InN and their alloys was well known; (2) strain considerations aside, the resultant effective energy bandgap of a MQW is dictated by conventional factors such as the particular thicknesses and compositions of the barrier and well materials employed (because of their respective bandgaps, and relative bandgap offsets) according to well understood quantum physics; (3) for all layers of a light emitter, consideration must be given to the respective compositions' lattice constants because lattice strains can cause problems in the ability to grow layers of sufficient crystalline quality.

ii. Turning to the issue of how strains influence the effective bandgap, Nakamura '350 teaches that compared to emitters having double-heterojunction active layers, those having quantum-well active layers exhibit poorer carrier confinement, but a narrower half width (or better color purity) (e.g., col. 1, lines 50-65). Moreover, Nakamura recognizes that the thickness, lattice-strains, thermal strains, doping levels and crystallinity of an active layer's material influences the color purity of a SQW or MQW active region in a manner that is well understood. For example:

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As explained above, it is possible to shift the emission wavelength to a longer wavelength side by thinning the active layer interposed between the first n-type clad layer and the first p-type clad layer. Namely, in the ordinary active layer of large thickness, an emission corresponding to the inherent band gap energy of the active layer could be obtained. However, in the active layer formed of a single-quantum well structure according to the present invention, it is possible to minimize the band gap energy through the thinning in thickness of the well layer, so that light of lower energy or light of longer wavelength as compared with that to be obtained through the inherent band gap energy of the well layer can be obtained. Moreover, since it is of a non-doped layer, a layer of more excellent crystallinity than that of the doped layer can be obtained, giving a higher output. As a result, an emission excellent in color purity with a narrowed half band width can be obtained through a band-to-band emission. (Col 31, line 58 - col. 32, line 8)

Fig. 17 shows the features of one example of a light-emitting device according to the present invention, indicating that the range of wavelength that can be shifted to the longer wavelength of emission also differs depending on the compositions of the second clad layer and the first clad layer giving a tensile stress to the active layer. Also, the range of preferable thickness of the active layer somewhat changes depending on the compositions of these layers. (Col. 32, lines 18-26)

The order of thermal expansion coefficient would become as follows: $\text{InN} > \text{GaN} > \text{AlN}$... Therefore, when a pair of clad layers having a smaller thermal expansion coefficient than that of an active layer are formed at a high temperature while sandwiching therebetween the active layer having a comparatively large thermal expansion coefficient and then the temperature is lowered down to room temperature, the active layer having a comparatively large thermal expansion coefficient is pulled by the clad layers, hence a tensile stress in the direction parallel to the interface between the active layer and the clad layers is effected on the active layer. Because of this, the band gap energy of the active layer is minimized, causing an elongation of the emission wavelength. (Col. 32, lines 33-65).

A preferable example of the light-emitting device...comprises a first n-type clad layer formed of an n-type nitride semiconductor containing indium or an n-type GaN, and an active layer formed in contact with the first n-type clad layer and made of a nitride semiconductor containing at least indium and having a larger thermal expansion coefficient than that of the first n-type clad layer, wherein the active layer is fabricated into a single-quantum well or multi quantum well structure so as to obtain a light of lower energy as compared with the inherent band gap energy of the active layer (col. 32, line 66 - col. 33 line 10)

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Namely, since GaN or [InN] constituting the first n-type clad layer 315 is inherently soft in crystal, any distortion to be generated due to the mismatching of lattice constants or due to a difference in thermal expansion coefficient between the second n-type clad layer 314 and the active layer 316 can be absorbed by the first n-type clad layer 315. (Col. 33, 28-34)

Due to this reason, the possibility [of cracking is minimized,] and the active layer can be elastically deformed by a tensile stress when the thickness of the active layer is 200 angstroms or less, thereby decreasing the band gap energy and possibly enlarging the emission wavelength. (Col. 33, lines 28-42).

iii. Thus, even if various claims are interpreted under the range-doctrine so as to not be anticipated by Nakamura '307, the Examiner has previously set forth sufficient rationales why these various limitations would have been at least obvious. Having made a prima facie showing of obviousness, the burden has shifted back to Applicant to rebut the showing. However, because Nakamura '350 does, in fact, teach that the clad and barrier may be composed of the same material, including GaN, and does appreciate that the subjacent n-clad composition influences the strains in--and color purity of--the active layer, Applicant's argument--that the color-purity issue was an unknown or nonobvious consideration--is not persuasive. As such, the rejections are still deemed to be proper.

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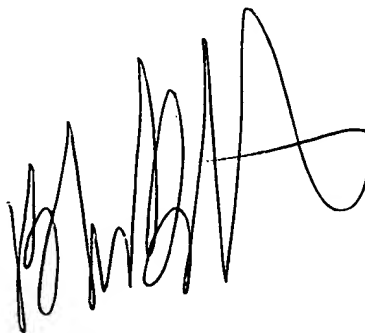
INFORMATION ON HOW TO CONTACT THE USPTO

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, **B. William Baumeister**, at (703) 306-9165. The examiner can normally be reached Monday through Friday, 8:30 a.m. to 5:00 p.m. If the Examiner is not available, the Examiner's supervisor, Mr. Tom Thomas, can be reached at (703) 308-2772. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

B. William Baumeister

Primary Examiner, Art Unit 2815

November 22, 2003

A handwritten signature in black ink, appearing to read 'B. Baumeister', with a large, stylized loop at the end.

**BRADLEY BAUMEISTER
PRIMARY EXAMINER**